Insert a node at a specific position in a linked list

locked

Problem Submissions Leaderboard Discussions

This challenge is part of a tutorial track by MyCodeSchool and is accompanied by a video lesson.

Given the pointer to the head node of a linked list and an integer to insert at a certain position, create a new node with the given integer as its $data$ attribute, insert this node at the desired position and return the head node.

A position of 0 indicates head, a position of 1 indicates one node away from the head and so on. The head pointer given may be null meaning that the initial list is empty.

Example
$head$ refers to the first node in the list $1 \rightarrow 2 \rightarrow 3$
$data = 4$
$position = 2$

Insert a node at position 2 with $data = 4$. The new list is $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$

Function Description Complete the function *insertNodeAtPosition* in the editor below. It must return a reference to the head node of your finished list.

insertNodeAtPosition has the following parameters:

- *head*: a SinglyLinkedListNode pointer to the head of the list
- *data*: an integer value to insert as data in your new node
- *position*: an integer position to insert the new node, zero based indexing

Returns

- *SinglyLinkedListNode pointer:* a reference to the head of the revised list

Input Format

The first line contains an integer n, the number of elements in the linked list.
Each of the next n lines contains an integer SinglyLinkedListNode[i].data.
The next line contains an integer $data$, the data of the node that is to be inserted.
The last line contains an integer $position$.

Constraints

- $1 \leq n \leq 1000$
- $1 \leq SinglyLinkedListNode[i].data \leq 1000$, where $SinglyLinkedListNode[i]$ is the i^{th} element of the linked list.
- $0 \leq position \leq n$.

Sample Input

```
3
16
13
7
1
2
```

Sample Output

```
16 13 1 7
```

Explanation

The initial linked list is $16 \rightarrow 13 \rightarrow 7$. Insert 1 at the position 2 which currently has 7 in it. The updated linked list is $16 \rightarrow 13 \rightarrow 1 \rightarrow 7$.

Submissions: 122
Max Score: 30
Difficulty: Easy

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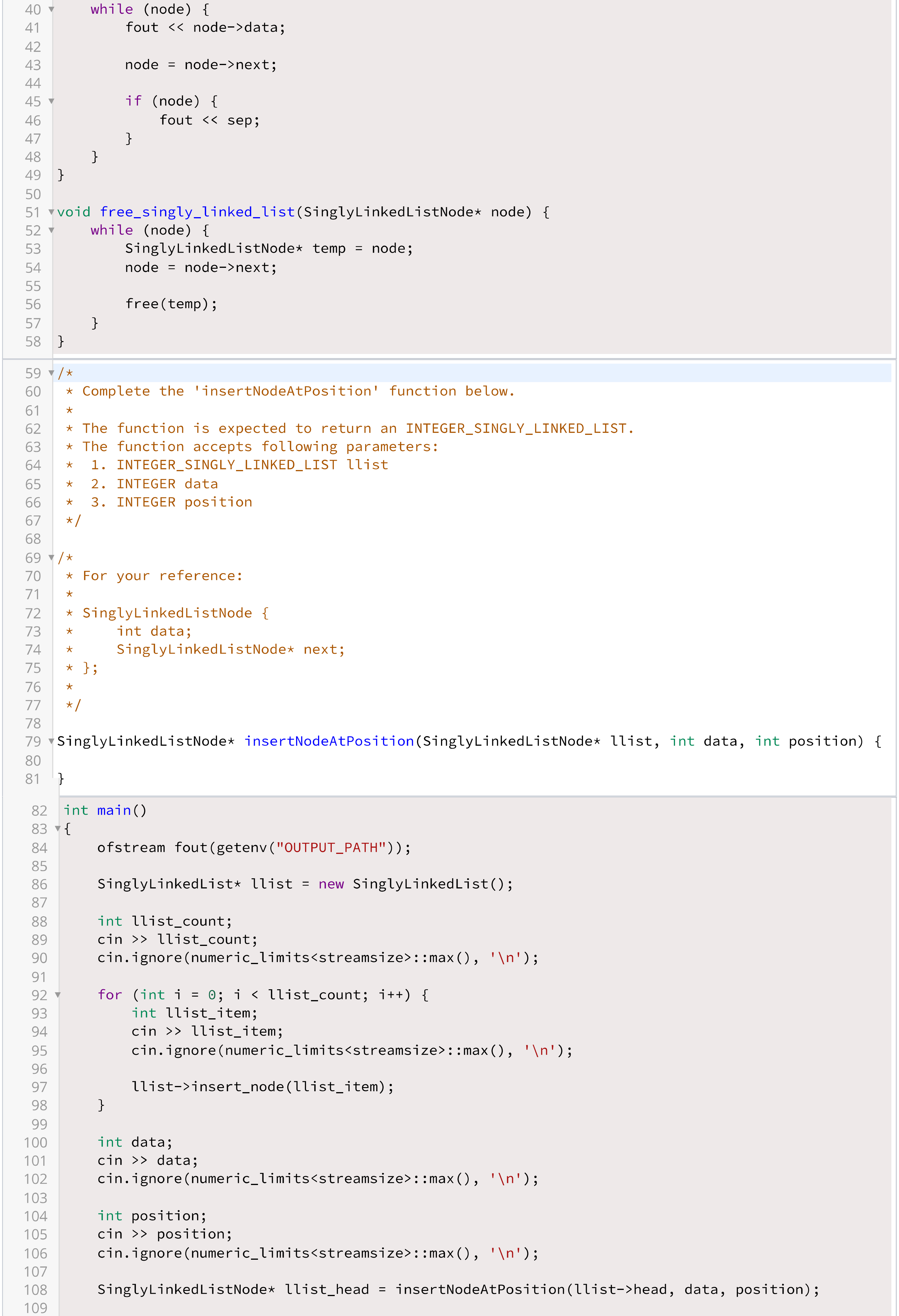
More

C++14

```cpp
#include ↔

using namespace std;

class SinglyLinkedListNode {
    public:
        int data;
        SinglyLinkedListNode *next;

        SinglyLinkedListNode(int node_data) {
            this->data = node_data;
            this->next = nullptr;
        }
};

class SinglyLinkedList {
    public:
        SinglyLinkedListNode *head;
        SinglyLinkedListNode *tail;

        SinglyLinkedList() {
            this->head = nullptr;
            this->tail = nullptr;
        }

        void insert_node(int node_data) {
            SinglyLinkedListNode* node = new SinglyLinkedListNode(node_data);

            if (!this->head) {
                this->head = node;
            } else {
                this->tail->next = node;
            }

            this->tail = node;
        }
};

void print_singly_linked_list(SinglyLinkedListNode* node, string sep, ofstream& fout) {
```



```
    while (node) {
        fout << node->data;

        node = node->next;

        if (node) {
            fout << sep;
        }
    }
}

void free_singly_linked_list(SinglyLinkedListNode* node) {
    while (node) {
        SinglyLinkedListNode* temp = node;
        node = node->next;

        free(temp);
    }
}
```

```
/*
 * Complete the 'insertNodeAtPosition' function below.
 *
 * The function is expected to return an INTEGER_SINGLY_LINKED_LIST.
 * The function accepts following parameters:
 *  1. INTEGER_SINGLY_LINKED_LIST llist
 *  2. INTEGER data
 *  3. INTEGER position
 */

/*
 * For your reference:
 *
 * SinglyLinkedListNode {
 *     int data;
 *     SinglyLinkedListNode* next;
 * };
 *
 */

SinglyLinkedListNode* insertNodeAtPosition(SinglyLinkedListNode* llist, int data, int position) {

}
```

```
int main()
{
    ofstream fout(getenv("OUTPUT_PATH"));

    SinglyLinkedList* llist = new SinglyLinkedList();

    int llist_count;
    cin >> llist_count;
    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    for (int i = 0; i < llist_count; i++) {
        int llist_item;
        cin >> llist_item;
        cin.ignore(numeric_limits<streamsize>::max(), '\n');

        llist->insert_node(llist_item);
    }

    int data;
    cin >> data;
    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    int position;
    cin >> position;
    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    SinglyLinkedListNode* llist_head = insertNodeAtPosition(llist->head, data, position);

    print_singly_linked_list(llist_head, " ", fout);
    fout << "\n";

    free_singly_linked_list(llist_head);

    fout.close();

    return 0;
}

```

Line: 25 Col: 1

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